Met Office

NEWS

Supercomputing leap in weather and climate forecasting

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Met Office and Microsoft join forces to build world's most powerful weather and climate forecasting supercomputer in UK

The Met Office has signed a multimillion-pound agreement with Microsoft for the provision of a world-leading supercomputing capability that will take weather and climate forecasting to the next level and help the UK stay safe and thrive, announced today on Earth Day (22 April).

This new supercomputer – expected to be the world's most advanced dedicated to weather and climate - will be in the top 25 supercomputers in the world and be twice as powerful as any other in the UK.

The data it generates will be used to provide more accurate warnings of severe weather, helping to build resilience and protect the UK population, businesses and infrastructure from the impacts of increasingly extreme storms, floods and snow.

It will also be used to take forward ground-breaking climate change modelling, unleashing the full potential of the Met Office's global expertise in climate science. The precision and accuracy of its modelling will help to inform Government policy as part of the UK's fight against climate change, and its efforts to reach net zero by 2050.

It follows the announcement by Government in February 2020 which committed £1.2 billion of funding to develop this state-of-the-art supercomputer.

Business Secretary Kwasi Kwarteng said: "This partnership between the Met Office and Microsoft to build the world's most powerful weather and climate forecasting supercomputer is a ringing endorsement for the UK's credentials in protecting our environment, as we prepare to host COP26 later this year.

"The new supercomputer, backed by a billion pound UK government investment, will act as a catalyst for unlocking new skills, technologies and jobs right across our economy – from data scientists to AI experts - all as part of our efforts to build back better and create a cleaner future."

Once up and running in Summer 2022, the new supercomputer will help ensure government, industry and communities are better prepared for severe weather and our changing climate through:

- More detailed models combined with an increased number of model scenarios and growing amounts of environmental and social data will mean that forecasts and projections for risk-based planning will be significantly improved. One example of how this will be used is in creating very detailed city scale simulations to provide localised climate information to improve city design, such as public transport infrastructure;
- Better forecasting of local-scale weather using very high-resolution simulations that can be quickly turned on in an area where severe weather is forecast. This will enhance emergency preparedness to local storms, heavy rain and flooding;
- Increased access to ever greater amounts of weather and climate data, providing businesses with new opportunities to innovate and create new services based on this information;

- Ever more accurate forecasts of wind and temperature information for the aviation industry driving ever greater fuel efficiency and safety. This will deliver significant economic and environmental benefits as part of the post-Covid recovery.

Penny Endersby, Chief Executive, Met Office, said: “We are delighted to be working in collaboration with Microsoft to deliver our next supercomputing capability. Working together we will provide the highest quality weather and climate datasets and ever more accurate forecasts that enable decisions to allow people to stay safe and thrive. This will be a unique capability which will keep not just the Met Office, but the UK at the forefront of environmental modelling and high-performance computing.

“This investment by the UK government is a great vote of confidence in the Met Office’s world-leading status as a provider of weather and climate science and services as well as in our national commitment to build a more resilient world in a changing climate, helping build back greener across the UK and beyond.”

Clare Barclay, Chief Executive Officer, Microsoft UK, said: “The Met Office has long been synonymous with excellence and innovation in our understanding of the impact of weather and climate. To make progress with the ecological challenges we face requires innovation, technology and partnerships. The potential of the deep expertise, data gathering capacity and historical archive of the Met Office, combined with the sheer scale and power of supercomputing on Microsoft Azure will mean we can improve forecasting, help tackle climate change and ensure the UK remains at the forefront of climate science for decades to come.”

Science Minister Amanda Solloway, said: “In the run- up to COP26, the UK is demonstrating global leadership in bringing together the very best scientific and technological expertise to develop solutions to tackle climate change.

“Backed by a £1.2 billion government investment, this pioneering partnership between the Met Office and Microsoft will be game changing for how the UK forecasts and protects people from severe weather events such as flooding.

“Establishing the UK as home to the world’s most powerful weather and climate supercomputer will not only help solve vital unanswered questions about our climate, but it will also drive economic growth and unleash highly skilled jobs – from data scientists to weather forecasters - as we build back better through innovation.”

As the Met Office and Microsoft work together over the next ten years it is expected that the collaboration will deliver both scientific and technological innovation that will ensure the Met Office and the UK is ready to harness the next generation of supercomputing and data technologies. This will enable the exploitation of scientific expertise to answer many of the big questions presented by our changing climate - improving forecasting of severe weather and impacts today and in the future.

This will ensure the UK maintains its global reputation for world-leading scientific and technological research and innovation. It is expected that the investment will result in financial benefits totalling up to £13billion (or £9:1) for the UK over its ten-year lifespan.

The supercomputer will be based in the south of the UK, and will help to bring about employment, apprenticeships, internships, mentoring opportunities, training in digital skills and support for start-ups in the South West and other locations across the UK.

It will also deliver research and innovation projects in areas such as data sciences, helping the UK make the most of the huge amounts of weather and climate data that will be available.

In line with Met Office, Microsoft and UK government ambitious commitments to Net Zero, the supercomputing capability will be one of the world’s most environmentally sustainable, powered by 100% renewable energy and delivered through market leading energy efficiency. It is expected that this will save 7,415 tonnes CO2 in the first year of operational service alone.

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